SINGLE-ELECTRON TRANSISTORS AND FABRICATION METHODS IN WHICH A PROJECTING FEATURE DEFINES SPACING BETWEEN ELECTRODES

Abstract of the Disclosure

A single-electron transistor includes a projecting feature, such as a pyramid, that projects from a face of a substrate. A first electrode is provided on the substrate face that extends onto the projecting feature. A second electrode is provided on the substrate face that extends onto the projecting feature and that is spaced apart from the first electrode. At least one nanoparticle is provided on the projecting feature between the first and second electrodes. Accordingly, the geometric configuration of the projecting feature can define the spacing between the first and second electrodes. The single-electron transistors may be fabricated by forming a projecting feature on a substrate that projects from a face thereof, forming a first electrode on the substrate face that extends onto the projecting feature, forming a second electrode on the substrate face that extends onto the projecting feature and that is spaced apart from the first electrode, and placing at least one nanoparticle on the projecting feature between the first and second electrodes.